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THE SEARCH FOR INDUSTRIAL MINERALS

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Edit. note—The following article was initially prepared in the early part of 1961. Since that time, the senior author, Dr. Wright, has left the Division to become Chairman of the Department of Geology at Pennsylvania State University. As head of the Los Angeles Branch of the Division, he was an authority on industrial minerals in California, specializing in talc. His work as editor of the Division's Bulletin 176, Mineral Commodities of California, *is widely known.*

Mr. Burnett, the junior author, is presently on the staff of the Division at San Francisco.

In the past decade the mineral industry has experienced a drastic change in emphasis. Metals, once the leader in production and value, have steadily declined in importance; in their place is a relatively new group, the industrial minerals.

Although many persons still associate the term "prospecting" mainly with the search for valuable deposits of the metallic minerals, in California, as in most other highly industrialized parts of the world, prospecting activity has been directed increasingly toward the discovery or recognition of deposits of industrial rocks and minerals. As generally defined, these are the mineral substances of commerce other than fuels and the ore minerals of metallic elements. Although ordinarily referred to as "industrial minerals", these materials sometimes are called "nonmetals"; in part because most of them have a nonmetallic luster, but mostly because the nonmetallic ores are utilized for their physical and chemical properties rather than for the extraction of metals.

This distinction, however, is not always easy to make. The mineral beryl, for example, can be considered a metallic mineral as it is the principal ore of the metal beryllium, but it is nonmetallic in luster and is also used in the production of beryllium-bearing industrial chemicals. Pyrite (iron sulfide), on the other hand, has a metallic luster, and in some parts of the world is used as a source of iron, but nearly all of the pyrite produced in California has been used in the production of sulfuric acid. These and other minerals, including bauxite, chromite, dolomite, and the lithium minerals serve a dual role as industrial and metallic raw materials.

The industrial minerals, although generally lacking in glamour, are just as important as the metals to our present culture and, in California, far exceed the metals in dollar value of production. Each year the California Division of Mines and Geology receives hundreds of inquiries from persons engaged in the search for new sources of industrial minerals. Such persons have a wide variety of backgrounds and objectives. Some are representatives of companies that already produce industrial minerals in California and are seeking to increase their reserves of these minerals. Others are employed by mining companies that wish to diversify or to expand into California. Still others are independent prospectors searching for any deposit of value or seeking advice concerning the usefulness of samples submitted to the Division for identification. The comments that follow are intended particularly for this last group who, though generally not affiliated with large mining companies, play an important role in the mineral industry.

The success of the search for industrial minerals in California is shown by the opening of several hundred new industrial mineral operations since World War II. Although some of these, especially operations of sand and gravel, specialty sands, clay, limestone, and expansible shale, were opened by large companies, small operators have also been able to develop and successfully operate many industrial mineral deposits. For example, small-scale operations have been opened on deposits of gypsite, rock suitable for road construction, dimension stone and roofing granules, pumice, pyrophyllite, talc, volcanic cinders, and on some deposits of sand and gravel.